$$P_{it}(s_i) = \begin{bmatrix} 1-\delta & & \\ & (\ ) & \\ & & 1-\delta \end{bmatrix} \quad \prod_{j=1}^{J} P_o(n_{ijt}; \lambda(d_j(s_i)))$$

$$\exp\{\log . P_{it}.s\}$$

$$n \times T \times M$$

$$\binom{N}{n} \; P(\overbrace{\text{alive at all}}^{aa} \wedge \text{unseen})^{N-n} \quad P(\overbrace{\text{alive at all}}^{aa} \wedge \text{seen})$$

$$\boxed{P(\text{unseen}) - P(\underbrace{\text{unseen} \wedge aa}_{(1-\beta)^T})}$$

$$\boxed{\text{HMM for } \underline{\omega} = \underline{0} \ \forall t}$$

$$M \begin{pmatrix} \pi_0 & \pi_1 & 0 \\ \pi_0 & \pi_1 & 0 \\ & \vdots & \\ \pi_0 & \pi_1 & 0 \end{pmatrix} \quad \begin{pmatrix} 1-\delta & P(s_i) & 1-\delta \\ & \vdots & \\ 1-\delta & P(s_i) & 1-\delta \end{pmatrix}$$

$$\boxed{P(\Omega_n \mid aa, \text{seen}) = \prod_{i=1}^{n} \left\{ \sum_{\underline{s}} \left(\underline{\pi} \; P_{i1}(\underline{s}) \Gamma \cdots P_{iT}(\underline{s}) \Gamma \, \mathbf{1} \right) \frac{D(s)\, p_{\cdot\cdot}(s)}{\sum D(s)\, p_{\cdot\cdot}(s)} \right\}} \Big/ P(aa \wedge \text{seen})$$